

AGENCY OF STEAM-POWER;

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AMONG all the physical elements which the ingenuity of man has ever employed for useful purposes, steam-power holds, by far, the highest rank. As a mechanical agent, it has rendered, and continues to render, the most important services to the arts, to manufactures, and to commerce. Although the expansive force of steam has been known to mankind for many ages, yet the application of it to the arts, is comparatively of recent date, and may still be regarded as in its infancy.

The first individual who gives any account of the application of the vapor of water as a mechanical force, is Hero of Alexandria, an eminently learned man, distinguished for the number and ingenuity of his inventions, who lived in the reign of Ptolemy Philadelphus, about one hundred and thirty years before Christ. He describes, in one of his works, two machines, which he had constructed to operate by steam, and which he regarded rather as means of amusement, than as designed for any useful purpose. Indeed, the idea does not seem to have occurred to him, that this prodigious power could be of any service to mankind. He ascribes to the action of steam, the sounds, which, fifteen centuries previous to his time, issued from the statue of

Memnon ; an opinion which, as Professor Renwick says, "is an ingenious explanation of the mode in which he could have effected the same object, rather than an account of what was really performed by the Egyptian priests."

Among modern writers, Cardan and Mathesius are the earliest who speak of the mechanical force of steam ; the former of whom, was also familiar with the fact, that a vacuum could be produced by the condensation of steam. Brancas, and the Marquis of Worcester, are among those who claim the honor of having first suggested steam as a moving power in mechanics. "It is said that the Marquis, while confined in the Tower of London, was preparing some food on the fire of his apartment ; and the cover having been closely fitted, was by the expansion of the steam, suddenly forced off, and driven up the chimney. This circumstance, attracting his attention, led him to a train of thought, which terminated in his important discovery."

The names also of Baptista Porta, a Neapolitan, of Solomon de Caus, a native of Normandy, of Sir Samuel Moreland, and others, are distinguished among those, who, in the seventeenth century, made experiments in the application of steam-power to practical purposes. But the most important and interesting period of the history of this agent, is the time when the steam-engine was improved, and we might almost say, invented by James Watt. He examined on scientific principles, the properties of steam, and developed them with wonderful success.

With the application of this power to navigation by Fulton and Stevens, in the year 1807, and its uses in producing locomotion, we are all familiar ; and as it is not our object to trace the history of steam-power, or attempt to settle the conflicting claims of the various competitors for the honor of having first applied it as a mechanical force, we proceed to speak in the first place, of its agency in promoting *civilization*.

In its application to the purposes of travel, the transportation of goods, and the navigation of rivers and oceans, it is in a thousand ways changing the face of society, and promoting the intercourse and enterprise, the social and political interests, of the civilized world. All this vast machinery for rapid intercourse, and the bringing of communities and nations together, is itself an evidence of the intense activity and energy of our age. It is a development of the law of progress, in full and vigorous

action. The shallow or prejudiced observer, or the venerator of antiquity, who can see nothing in modern times but innovations, and a sad departure from ancient and long established usages, may view this spectacle as the offspring of the restless or avaricious spirit of the age. But these iron roads which are intersecting every part of this and other lands, and are uniting city to city, and state to state, are designed, under Providence, for some other purpose than simply to yield dividends to stockholders. Mountains are brought low, and valleys are exalted, and the crooked made straight, and the rough places plain, that civilization and human improvement may advance. The very ploughman in the field, who stops to look at the train as it flies by him, has his mind quickened by the view, and returns to his toil with renewed vigor. The individual who is borne along with such lightning speed, if possessed of ordinary sensibility, cannot but be stimulated, and mentally quickened. He feels that he lives in an age, when the will of man is subduing the mightiest agents of nature, and making them tributary to his interests.

If we examine the history of the past, we shall find that the facilities for communication between different cities and nations, have been, in every age, the index of the state of civilization. In the earliest periods of the world, and among barbarous tribes, there was little or no communication except for purposes of war. Each community being ignorant of the habits, feelings and pursuits of others, regarded them as enemies to be annoyed, pillaged, or slaughtered, as inclination, or supposed interests, might prompt. Consequently, literature, the useful arts, and religion, were all in a low state. There being little interchange of commodities contributing to the comfort and luxury of life, and no importation of knowledge, and the discoveries of science, from the more cultivated nations, as at the present time; the human mind was stagnant, and society rude, and the means of subsistence scanty and coarse. The Phœnicians were the earliest navigators of the world, and although they possessed only a narrow strip of ground, between Syria on the north, and Judea on the south, they yet acquired great power and renown, and absorbed the commerce of the Western Empire. Sidon, their capital, was distinguished for opulence and refinement, and Tyre was ornamented with many magnificent buildings. They cultivated philosophy, and invented, or improved the sciences of arithmetic and astronomy, and introduced letters into Greece.

The most splendid periods, in the history of the kingdom of Israel, were, when there was the freest intercourse with foreign nations. In the reign of Solomon, a lucrative trade was opened with Egypt and Phœnicia, and rich cloths, linen, gold, and other commodities were brought from Tyre, and exchanged for corn, balm and other articles of export. Ships manned by foreign sailors, were sent to foreign countries, and even as far as Spain. At this period, learning, architecture and religion flourished.

We are aware that the age of Roman glory was an age when avenues of trade and travel were open between foreign countries. While the streets of ancient Rome were but partially paved, and are described as being in a rude and even filthy condition, the Romans as well as the Greeks, paid special attention to their military roads. "There was no part of the Roman polity," says a correct historian, "which so effectually promoted the good of mankind, or which has transmitted such exalted ideas of the imperial grandeur, as the number and magnificence of the roads. Though constructed principally for military purposes, they were of vast utility to the districts which they traversed, and proved the most efficacious means of promoting the civilization of the conquered people. They also greatly assisted the missionaries of Christianity in promulgating the doctrines of the cross."

The power of steam as applied to the conveyance of passengers, and the transportation of merchandize in our Western States, where the rivers are of such immense length, and the amount of produce to be taken to market so enormous, is an element of civilization and progress which can scarcely be over-rated. Were we to seek for the prominent cause of the rapid growth of that country, we should be forced to fix upon the introduction of the steam-engine.

According to a recent report, presented at a river and harbor convention held in Chicago last year, we learn that there are two hundred and fifty-one steamers plying to St. Louis alone, and that the whole number on the Western waters amounts to twelve hundred.* In 1846, the receipts at New Orleans from the upper country of the Mississippi amounted in value to seventy-seven

* The statistics given in this article, are drawn from the most authentic sources within reach. Besides the difficulty of obtaining the exact truth in every case, steamboats and railroads multiply so rapidly, that statistics which are correct to day, may not be so to-morrow.

millions of dollars. The total value of the inland commerce afloat is four hundred and thirty-nine millions ; being double the amount of the whole foreign commerce of the nation.

It is stated that a railroad has been surveyed, and will soon be in progress from Chicago to the Mississippi, to connect with the great chain to Buffalo, Boston and New York. The moment this is opened there will be a tide of immigrants pouring into Northern Iowa, a country that will then possess all the advantages which Wisconsin and Northern Illinois have enjoyed, in being in the vicinity of the great lakes ; besides having the attractions of richness of soil, salubrity of climate, and an abundance of streams.

If we turn now, and look at the republics of South America, where there are no railroads, and no steamboats, except a line which within a few years has been established along the coast of Chili and Peru,* we shall find an almost utter destitution of enterprise, progress, and the elements of national prosperity.

Our knowledge, too, of those countries, is far more limited than of those which are even more distant, but with which we have communication by steam. We are much better acquainted with what is transpiring in England, France, Italy and Germany, than with what is taking place in New Grenada, Venezuela and Guiana, the most Northern States of South America.

No one, indeed, can examine a splendid steamer, with its beautiful accommodations, its colossal machinery, and its noble build, without regarding it as the representative of a high state of civilization. Contrast it with the rude canoes which once floated upon the same rivers, now crowded with these majestic structures ; and how forcibly are we reminded of the changes so recently wrought upon this continent. In looking, too, at the extensive and complicated machinery of a large factory, and observing one man, with the aid of steam, doing the work which it formerly required fifty or a hundred persons to accomplish, we are astonished at the revolution this element is effecting in society, and can assign no limits to its power. If while yet in its infancy, it is accomplishing such wonders, what may we not

* William Wheelwright, Esq., a native of Newburyport, Mass., is entitled to the highest praise for his indefatigable efforts in establishing this line of steamers. Independent of the pecuniary advantage to those countries, this movement is vitally connected with the future prosperity, and intellectual and moral condition, of that people.

expect when it reaches maturity, and has the aid of a longer experience in its application to the arts?

Let our towns and villages be supplied with factories, and our states intersected at every point with railroads, and our rivers crowded with thousands of steamers, and what activity, energy, and prodigious power will be imparted to the nation! And that this is our destiny, whether for weal or for woe, no one can fail to discern. The steam-engine is destined to amass for us immense stores of wealth, and develop with unparalleled rapidity our resources, and clothe the nation with a strength and influence second to no other upon the globe. While other nations, by resisting the improvements of the age, and clinging to antiquated usages, are remaining stationary, we shall be shooting forward, and rapidly increasing in all the elements of national prosperity.

In the second place, the agency of the steam-engine, is no less conspicuous in promoting *general intelligence*. Never, since the invention of printing in the fifteenth century, has the press possessed such power as now. The introduction of steam into our large printing establishments, has enabled publishers to multiply books and periodicals to an indefinite extent; and the influence of the periodical press has become almost unbounded. These publications, multiplied almost as the leaves of the forest, and entering every family, and counting-room, and work-shop; read at the fireside, in the club-room, the steamboat, and the railroad car; and pouring in, day after day, and week after week, cannot but be exerting an immense influence. In regard to all the great questions, and projects, and enterprises, of the day, we are insensibly, though powerfully, influenced by the tone and language of the daily and weekly press. Is a political revolution to be effected? The newspaper and periodical press must chiefly do the work. Are our sympathies to be excited in behalf of the famishing of another nation? The press must furnish us with the sad tidings, and make the appeal to our hearts. Are any great public, or anniversary, meetings held? The press enables the speaker to have the whole country as his audience. Do our rulers, or legislators desire to know the feelings and sentiments of the people in relation to any measures of national interest? They must look to the press for information. We have more than once been struck with the fact, that, while the mass of the people throughout our union, were anxiously looking

to those in power to learn what they would do ; our rulers have as anxiously been looking to the people for their sentiments and opinions, as expressed through the newspapers and periodicals flowing in upon them from every part of the land.

As a striking illustration of the power of the steam-engine in its application to printing, we might refer to the present operations of the American Bible Society. That society, according to the report of one of its agents, has eight steam-power presses two of them of an enlarged size, capable of printing at one impression forty pages of the duodecimo Bible, or ninety-six pages of the pocket Testament ; and giving thirteen impressions in a minute, or seven hundred and eighty in an hour. In the month of August, there were three hundred persons employed daily, in the manufacture of Bibles and Testaments. They were consuming in printing, seven or eight tons of paper per week, and issuing more than two thousand copies a day. Since the formation of this Society, they have issued more than five million copies at home, besides doing much to send the Bible abroad ; and in connection with the British and Foreign Bible Society, and other kindred institutions, there have been issued, at least thirty millions of copies in one hundred and seventy different languages or dialects. Now let these steam-presses be established in China, in India, and among those who speak the Turkish language, where, forty years ago, there was not a single Bible to be found, and let them be multiplied in this country, and in Europe, and how speedily might the world be furnished with the word of life ! If the steam-engine could be employed for no other purpose than to print the word of God, how inestimable a blessing it would be to mankind !

The unparalleled cheapness with which the Bible can be furnished in this way, places it within the means of the poorest to obtain a copy of the Scriptures. Before the invention of printing, it required from a laboring man, in England, the earnings of thirteen years of constant labor to purchase a copy of the Bible. But now, since the application of the steam-engine to the press, the entire volume may be obtained for twenty-five cents, an amount easily earned in a few hours at the farthest.

In the year 1299, the Bishop of Winchester on borrowing a Bible from the Cathedral Convent of St. Swithen's gave a bond for the return of it, drawn up with great solemnity. For the

bequest of this Bible, with one hundred marks, the monks were so grateful, that they appointed a daily mass to be said for the soul of the giver. Indeed any book presented to a religious institution, was deemed so valuable a donation, as to entitle the individual to eternal salvation ; and it was usually offered upon the altar with great pomp and ceremony.

So rare were books at this time, that it was only the most wealthy and powerful who could obtain them, and the other orders in society, "were only rescued from the darkness of total ignorance by the reflected light of their superiors, and raised above the rudeness of barbarism, by that partial improvement which men of cultivation and refinement necessarily impart, to all within the sphere of their influence."

Who can estimate the effects upon society of such a change as that now before us? Instead of having as formerly, a single Bible in a whole kingdom, or one deposited in a national library as a rare curiosity, or hid away in a cloister, the Scriptures may be multiplied to an indefinite extent ; and scattered every where, as the leaves of the tree of life, for the healing of the nations. Within a very short period, every family in a nation of the size of our own, might be illumined with the sacred light of God's holy word.

In the multiplication, too, of works of science, poetry, philosophy, religion, and general literature, the facilities afforded by the application of steam-power to the press, are unbounded. The poor, as well as the wealthy, the obscure, as well as the most distinguished, may now enrich their minds, from the choicest stores of knowledge. The writings of men eminent for learning and piety, such as Doddridge, Baxter and Edwards, may be multiplied indefinitely ; and already, if we are correctly informed, the aggregate issues of all our benevolent societies, amount to about ten thousand volumes per day.

In the third place, the steam-engine is destined to be a powerful instrument *in extending Christianity* over the world. It is a remarkable fact, that Christianity creates its own agents for the extension of its principles and influence. Nearly all the inventions and discoveries of modern times, are the fruits of the invigorating effect of Christianity upon the human mind. And it is no less remarkable, that these agents are produced just at the time when they are most needed. The art of printing was

invented about the year 1438, between the time of Wicliffe, in 1324, who was called the "morning star of the Reformation," and the birth of Luther, which took place in 1484. This was the very period when the press was needed for rapidly disseminating the new doctrines, and enlightening the mass of the people, in regard to the necessity, and the principles of, the Reformation.

At the present time, too, steam-navigation is introduced, and becoming general, at a period when the nations of the world are throwing open their ports for the reception of the gospel. Fifty years ago, when the element of steam had not been applied to purposes of navigation, five hundred millions of the human family closed their gates against the missionaries of the cross; and now they have been opening them, almost at the very moment when it is proved that the ocean can be safely and profitably navigated by steamers.

Let, therefore, through the medium of travel and frequent intercourse, the light of Christian nations be brought in contact with the darkness of heathenism, let the refinement, cultivation, intelligence and useful arts, which are the fruits of the Gospel, be compared with the rudeness, ignorance, and degradation produced by Paganism, and the happiest results must follow.

One of the greatest obstacles to the introduction and progress of Christianity in heathen lands, is the aversion of the mass of the people, to any changes, or any innovations upon long established usages. Secluded as most of these nations are, from the rest of the world, and tenaciously adhering to customs, modes of life, and forms of religious worship, which have been followed by their fathers, from time immemorial, they have felt, as for instance the Chinese have long felt, that it was impossible that their condition could be improved. Let, however, this veneration for the past be once broken, and the idea impressed upon their minds, that it is possible to improve their social condition; and it will be comparatively easy, with this charm once dissipated, to convince them, that there may be a better faith than that to which they cling, and better hopes of future happiness than those which the dogmas and superstitions of Paganism afford. By the indirect and incidental effects of free intercourse with the less enlightened portions of the earth, much may be accomplished towards the destruction of this obstacle.

Indeed its influence already, is strikingly illustrated, in its effects upon the countries bordering upon the Mediterranean, and particularly upon Turkey. The intercourse opened between this country and other portions of Europe, by steam-navigation, is disturbing the veneration for antiquity, and affecting the habits and manners of the people. New ideas imperceptibly obtain a lodgement in the mind. The views are expanded, and a thirst for knowledge, and a desire for the refinement and luxuries of a highly cultivated state of society, is excited. We cannot wonder that the late Pope at Rome was exceedingly afraid of rail-roads, and forbade their being established within his dominions. For the rumbling of the cars near the Vatican would have conveyed to his mind, the melancholy tidings that society was advancing, that there were symptoms of life and activity even among the victims of papal oppression. He feared, also, the too numerous influx of foreign Protestants, with their notions of liberty, and individual rights, and the privilege of worshipping God according to the dictates of conscience. Increased facilities for travelling were, in his view, only increased dangers, gathering thick and fast around his throne. Nor did he regard the steamer on the Mediterranean, with any more complacency. This he feared might disturb the stagnant ocean of papal superstition, and cause some ripples upon the sea of spiritual death.

The present Pope, however, appears to be less timid ; and is disposed, even against the will of the Austrian government, to yield a little to the pressure of the age. The demands of the times are too loud, and too frequent, to be unheeded by him. But let the seven hills once echo the thunder of the flying car, let the steam-press be established in the Imperial City, and throw off the sacred pages containing God's message to mankind, and the days of papal dominion will be numbered. No crowd will then be found, ready to bow in humble adoration and kiss the foot of the usurper of Heaven's authority. No abject slaves will plead for the pardon of their sins, from the lips of a worm of the dust. No corrupt hierarchy will then monopolize the blessings of Heaven, and sell them for gain, and traffic in the souls of men. Even the monk will leave his cloister, and come forth to discharge the duties of a responsible being. Society will be elevated. The chains of superstition and oppression will be broken ; and emancipated mind will assert its rights and fulfil its destiny.

Notwithstanding the short time which has elapsed since the introduction of the railway system, there were, according to the American Almanac, on the first day of January, 1847, in Great Britain, two thousand and four hundred miles of railway; and on the continent of Europe, eight thousand and six hundred miles. Russia, in 1836, had only one short road of eighteen miles, from St. Petersburg to a watering place. But now, the Emperor has a road in the course of rapid construction, extending from St. Petersburg to Moscow, a distance of four hundred miles, and superintended by American engineers. He has another from the same point, more than a thousand miles in length, extending to the Caspian Sea, with branches to the Black Sea, and in other directions. Although like the old Roman roads, it is designed for military purposes, this may be hereafter used to facilitate the progress of soldiers of the cross to execute their mission of mercy.

Prussia, is fast introducing railroads, upon a liberal scale, partially aided by the Government. France had in 1844, only five hundred and thirty-seven miles of railroad completed, although now the French are making rapid progress. But Spain and Portugal, the strong holds of political and ecclesiastical despotism, have thus far excluded them. The subject, however, even there, is exciting attention; and these nations as well as Italy, must ere long, yield to the spirit of the age. The United States, in proportion to their population and wealth, have made greater advances in railroads than any country in Europe. We have about five thousand seven hundred and forty miles completed and in use, at an expense of one hundred and twenty-two millions of dollars. As many more miles are in course of construction, and at least twice as many more projected.

What abundant facilities are here afforded, for extending abroad the benign influence of Christianity, and with what emphasis is the church of God called upon to go forth, and take possession of the land!

Those whose only aim is the accumulation of wealth may see in all these preparations nothing but the means of augmenting their riches. To the eye of the statesman, they may appear as additional bonds of union, and new sources of national prosperity. But, to the Christian, they appear in their moral relations, and as plainly designed by Providence, to promote the

spiritual welfare and happiness of mankind. Let the friends of Christianity, avail themselves of those in our own country, as avenues for the conveyance of religious truth, as highways over which shall roll the chariots of salvation ; and we may present to the world the sublime spectacle of a nation extending from ocean to ocean, and swayed by the principles of freedom, justice and humanity ; a nation distinguished for its literature, its advancement in the arts, its commercial eminence, and inexhaustible resources ; a nation offering itself as the home of the oppressed, as the dispenser of food to the hungry, of knowledge to the ignorant, of light to the benighted, and of hope to the despairing ; a nation, consecrated to the glorious work of evangelizing the whole human family.

Let, too, the different nations of the earth, be connected by steamers, as different parts of a country are by railroads, and let the ocean, no more a barrier to intercourse, become a broad highway over which rapid and frequent communication may be kept up, between Christian and other lands ; and soon would a blind veneration for antiquity be exchanged for astonishment at the improvements and inventions of modern times. Soon, would the old landmarks be swept away ; and idols be thrown to the moles and the bats. By means of this simple yet mighty agency, rightly employed by the church, Christ would “overturn, and overturn, and overturn ;” until he, whose right it is, shall reign triumphant over the earth.